# A STUDY TO EVALUATE THE EFFECTIVENESS OF WARM WATER FOOT BATH THERAPY ON REDUCING THE LEVEL OF TEMPERATURE AMONG CHILDREN WITH HYPERTHERMIA IN MASONIC HOSPITAL AT COIMBATORE


**COIMBATORE**

A DISSERTATION SUBMITTED TO THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILMENT OF REQUIREMENT FOR THE DEGREE OF

**MASTER OF SCIENCE IN NURSING**

OCTOBER 2015

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BY

**LINTU ELDO**

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VIVA VOICE

1. INTERNAL EXAMINER……..……...
2. EXTERNAL EXAMINER…….…..……..……

This is to certify that the dissertation entitled ‘‘**A Study To Evaluate The Effectiveness Of Warm Water Foot Bath Therapy On Reducing The Level Of Temperature Among Children With hyperthermia In Masonic Hospital At Coimbatore’’** is a bonafide work done by **Mrs.Lintu Eldo, Annai Meenakshi College Of Nursing** in partial fulfilment of the university rules and regulations for award of **M.Sc. Nursing Degree Course** under my Guidance and supervision during the academic year **October 2015**

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# *DEDICATION*

**********

*"I dedicate this book to*
*God almighty who blessed me to finish this work successfully."*

*I submit this credit to my husband*
***Mr. GEORGE K YOYAKKI***
*Who made my life most pleasure and without him it wouldn't have been possible to complete my study.*

*I dedicate this book to my lovable Parents*
***Mr. ELDO T JOSEPH &Mrs. JINI ELDO***
*those who made my life purposeful and meaningful*

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***Ms .Linta eldo, Ms Libna eldo***
*who gave me a marvelous emotional support*

*I dedicate this book to my father-in- law*
***Mr. K P YOYAKKI** and mother-in-law*
***MRS.ALIYAMMA YOYAKKI***
*For their love and support.*

*****

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*"*Knowledge is an end based on acknowledgement.*"*

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# ABSTRACT

INTRODUCTION: Fever is the childhood problem. A wide range of childhood illness is accompanied by fever. Fever is said to occur in children when the body temperature is above $37^0$ C. High fever can cause seizure in young children. In this context, complementary therapy like warm water foot bath therapy has more useful. OBJECTIVE: The objective of the study is to evaluate the effectiveness ofwarm water foot bath therapy on level of temperature among children with hyperthermia. DESIGN: A quantitative approach using quasi experimental pre and post test designwith control group. PARTICIPANTS: 60 hyperthermia children were selected by using non-probability purposive sampling techniques from Masonic hospital. INTERVENTION: Warm water foot bath therapy is given for a period of 15 minutes at one time.TOOLS: Standardized digital thermometer was used to assess the level of body temperature. RESULTS: Analysis among experimental and control group by using independent 't' test found significant at $p<0.05$ level. CONCLUSION: Warm water foot bath therapy is effective on reducing level of body temperature for children with hyperthermia.



Key words: Warm water foot bath therapy, level of temperature, children with hyperthermia.

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# CHAPTER I

# INTRODUCTION

*"Children are like wet cement,*

*Whatever falls on them makes an impression"*

-Bacon.

## Background of the Study

Children are not small adults but special individuals with unique minds, bodies and needs. The childhood period is vital because of socialization process by the transmission of attitudes, customs and behavior through the influence of the family and community. Family's cultural and religious belief, educational level and ways of living influence the promotion and maintenance of child health. In India, about 35 per cent of total population is children below 15 years of age.

The sick child is different from sick adult. The difference of illness in children and adults are based on anatomic, physiologic and psychological differences between the immature child and the mature adult. Parents can usually recognize the early features of illness in their child.

The common childhood illnesses are gastroenteritis, ear infection, scarlet fever, tonsillitis, whooping cough, respiratory tract diseases etc. Fever is the main symptoms of these diseases.

A wide range of childhood illnesses are accompanied by fever. Fever is said to occur in children when the body temperature is above $37^0$C ($98.6^0$F). It occurs when various infectious and non-infectious processes interact with the host's defense mechanism. Fever has been recognized as a symptom and not a disease. Fever is a natural response of the body that helps in fighting of foreign substances. Thermoregulatory center in the hypothalamus regulates body temperature. During fever, dilation of internal blood vessels and constriction of peripheral blood vessels occurs.

Fever is a part of childhood illness. Although normal febrile responses are self limiting, it can be miserable for the child; it causes anxiety for parents and expensive for health services. Children those who are affected with fever can accompany symptoms such as lethargy, fussiness, poor appetite, sore throat, cough, ear pain, vomiting, and diarrhea. High fever can cause seizures in young children.

Under normal circumstances human beings are capable of maintaining a normal range of internal body temperature that is called the set point. When body temperature rise over the upper limit of the set point, heat loss mechanism including vasodilation and sweating are activated.

Once the hypothalamic set point is raised, neurons in the vasomotor center are activated and vasoconstriction commences. Shunting of blood away from the periphery to the internal organs decreases heat loss from the skin, and the person feels cold. The process of heat conservation and heat production continues until the blood bathing the hypothalamic neurons match the new thermostat setting. Once that point

is reached, the hypothalamus maintains the temperature at the febrile level by the same mechanisms of heat balance that are operative in the afebrile state.

Complications of fever may include severe dehydration, hallucinations, fever-induced seizure (febrile seizure) among children ages 6 months to 5 years. Fever associated with severe infection s or patient whose immune system is compromised can be life threatening. Very high fever that is sudden or which has occurred over a prolonged period can be dangerous and cause serious complications, ranging from brain damage to death. Any type of fever (higher than normal body temperature and associated with infection) in newborn babies and infants should not be permitted to rise too quickly. The hypothalamus does not work as effectively in babies and infants. If fever in a baby or infant reaches $42^0$ C, brain damage can occur.

Management of fever mainly focuses on reducing thermostatic set point in the hypothalamus by antipyretics and enhancing heat loss by physical methods.

Antipyretic therapy is an effective pharmacological measure to reduce fever. Along with pharmacological measures, there are many non-pharmacological measures recommended to reduce the fever in children including cold sponging, tepid sponging, external cooling, alcohol sponging and warm water foot bath therapy.

One of the most essential substances in the world is water. Water being a good thermal conductor, can influence temperature regulation mechanism of the body through circulation. Many studies have shown that hydrothermal therapy is an effective method for treating fever.

Hydrotherapy is broadly defined as the external application of water in any form or temperature (hot, cold, steam, liquid, ice) for healing purposes.

The present healthcare system under National Health Policy has been given a lot of emphasis on merging of alternative and complementary therapies along with other treatments to provide comprehensive healthcare.

Some of the non-pharmacological measures such as tepid sponging, cold sponging is also found to be effective in reducing fever. But it may result in rapid cooling and may cause shivering in the patients, which is a discomfort to the clients. Hydrothermal therapy is one such modality shown to be effective in reducing fever. Studies have shown that warm water foot bathing helps to provide comfort and reduce high temperature through sweating.

Warm water foot bath therapy is a local immersion bath covering the feet and ankles at a water temperature ranging from $90^0$ -$110^0$F.

Warm water foot bath therapy causes blood vessels to dilate and improve blood circulation, which releases heat in the form of sweat and supply of oxygen to brain cell which aids in the elimination of toxins. The immersion of the body or part of the body in a water bath stimulates circulation. A warm water foot bath therapy increases nourishment to the tissues and relaxes tension.

Warm application to the foot causes the congested blood to flow towards distant parts of the body and is brought to the dilated vessels of the foot and leg.

When warm water foot bath therapy applied for 15-20 minutes, the blood vessels in the feet starts expanding and gets improved circulation, neutralizing acid and killing bacteria, and relieving aches, tiredness and fever. The improved blood circulation resets the hypothalamic set points by heat transfer from higher heat area to lower heat area.

The warm water foot-bath is not only excellent for reducing temperature but also useful for relieving headache, inflammations of the pelvic organs, overcoming chilly sensations, producing perspiration and relieving sore, aching or cold feet.

Yann-Fen Chao, (2009) conducted a study to assess the effectiveness of warm water foot bath and tepid sponging among 20 children aged 5months to 5 years with fever by adopting randomized sampling technique. The study results showed that sponge bath subjects cooled faster during first hour but there was no significant temperature difference between two study groups. On the other hand subjects in the sponge bath group had significantly higher discomfort scores due to shivering as a result of rapid cooling in cold sponging. But in case of warm water foot bath therapy rapid cooling is not brought about. Temperature is brought down gradually, so that it allows slow heat loss, thus avoiding rapid cooling and shivering. The study concluded that warm water foot bath therapy was more effective for children with fever.

Warm water foot bath therapy is considered as a non-pharmacological, safe and side effect free, cost effective, and easy to administer technique.

## Need for the Study

Fever is a common childhood problem faced by health care personnel including doctors, nurses and others in both hospital and community.

Fever is a natural response of the body that helps in fighting of foreign substances. Fever is a symptom not a disease. Main symptom of respiratory illness is fever. Fever is said to occur in children when the body temperature is above $37^0$C.

American Academy of pediatrics (2012) estimates that 90% or 6.6million children reported fever in past 12 months.

According to Public Health Association of Australia (2012), Rheumatic fever mainly affects children ages 5-15and occurs approximately14-28 days after strep throat or scarlet fever.

According to National Center for Health Statistics(2013)febrile seizure occur in 2-4% infant and children under 5 years of age, with the majority between 12 and 18 months of age. Up to 50% of cases will show recurrence if the first febrile seizure occurred when under 5 years of age. 75% reoccur with 12 months of the first febrile seizure.

The New Environmental Health Commission, United States (2013) estimates that the 2010-13 prevalence rate of fever among children (5-14 years) in the United States was approximately 57%.

National Health Interview Survey (NHIS 2011) states that fever affects 25.7 million people, including 7.0 million children under 15years old and it is a significant health and economic burden to patients, their families, and society.

As per Ministry of Health (2009) in Tamil Nadu, the overall prevalence of fever in children was 18%in the age of 6-12 years.

Fathia Attia Mohammad (2012) states that typhoid fever is a systemic infection, caused mainly by Salmonella typhi found only in man. It is characterized by a continuous fever for 3-4 weeks, relative bradycardia, with involvement of lymphoid tissue and considerable constitutional symptoms. Each year, world over, there are at least 13-17 million cases of typhoid fever, resulting in 600,000 deaths. With an estimated 16–33 million cases annually resulting in 216,000 deaths in endemic areas, the World Health Organization identifies typhoid as a serious public health problem. Its incidence is highest in children and young adults between 5 and 19 years old.

WHO (2010) states that 80% of malaria deaths occur in 14 countries and about 80% of cases occur in 17 countries. Together, the Democratic Republic of the Congo and Nigeria account for over 40% of the estimated total of malaria deaths globally.

Pan American Health Organization (2012) state that 2.5- 3 billion people (40% of the global population) continue to live at constant risk of infection, while 50 million cases and 24000 deaths are occur in 100 endemic countries worldwide annually, and nearly 5,00,000 cases of which 90% children are hospitalized. The

Southeast Asia region contributes 52% or 1.3 billion cases annually. India is one of seven identified countries in the region regularly reporting incidence of dengue fever.

Department of Health, India (2011) states that dengue is endemic in 29 states. About 18,059 cases were reported with 119 deaths. The case fatality rate was 0.65%. The highest number of cases were reported from Punjab followed by Tamilnadu, Gujarat, Kerala and Andhra Pradesh.

James Wiley(2009) conducted an experimental study to assess the effect of hot water foot bath therapy to reduce fever among 100 children by adopting randomized sampling technique. It reveals that there is significant reduction in fever after hot water therapy. The study concluded that warm water foot bath therapy is effective in reducing fever.

Van Stuijeenberg M, Tjiang G C,(2008) conducted a study to assess the parental fear regarding fever and febrile seizers among 230 parents by adopting randomized sampling techniques. The study revealed that 45% parents were very afraid regarding fever and febrile seizure. The study concluded that parental fear of fever and febrile seizure is a major problem.

Rajeev Gupta (2008) conducted a study to assess the effectiveness of tepid sponging and antipyretic drug versus only antipyretic drug among febrile children. The study results shows that apart from the initial rapid temperature reduction, addition of tepid sponging with antipyretic administration does not offer any advantage in ultimate reduction of temperature; it may result in additional discomfort.

Nurses have an important role in nursing management of fever in children is to prevent complication like febrile seizures. Though there are traditional measures like cold sponging, tepid sponging, external cooling are being implemented in the clinical areas to manage the fever in children, these measures causes more discomfort, crying and irritability during fever management in young and grownup children. They also induce vasoconstriction of the cutaneous vessels and increased shivering due to rapid cooling. The warm water foot bath therapy is a newer aspect, which is said to have an important effect in the reduction of body temperature through the vasodilation of the blood vessel. So the investigator decided to carry out a study on effect of warm water foot bath therapy on reducing the level of temperature among children with hyperthermia in selected hospital at Coimbatore.

## Statement of the Problem

A Study to Evaluate the Effectiveness of Warm Water Foot Bath Therapy on Reducing the Level of Temperature among Children with Hyperthermia in a Selected Hospital at Coimbatore.

## Objectives

- To assess the pre and posttest level of temperature among children with hyperthermia in experimental and control group.
- To evaluate the effectiveness of warm water foot bath therapy on reducing level of temperature among children with hyperthermia in experimental group.
- To determine the association between post-test level of temperature among children with hyperthermia and their selected demographic variables in experimental and control group.

## Hypotheses

$H_1$**:** There will be a significant difference between the mean pre and post test level of temperature among children with hyperthermia in experimental and control group.

$H_2$**:** There will be a significant difference between the mean post test level of temperature among children with hyperthermia in experimental group and control group.

$H_3$**:** There will be a significant association between mean post test level of temperature among children with hyperthermia and their selected demographic variables.

# Operational Definitions

## Evaluate

According to Collins English dictionary, 'evaluate means to judge or determine the significance, worth or quality'.

In this study evaluate refers to the determine the effectiveness of warm water foot bath therapy to bring reduction in level of temperature.

## Effectiveness

According to Dorland's pocket medical dictionary, effectiveness means the desired result produced by an action.

In this study effectiveness refers to the ability of warm water foot bath therapy to bring reduction in temperature among children with hyperthermia as measured by using a digital thermometer.

## Warm water foot bath therapy

According to Herald of Health (1998), 'warm water foot bath therapy is a local immersion bath covering the feet and ankles at a water temperature ranging from $90^0$ to $110^0$F'.

In this study warm water foot bath therapy refers to immersion of both the feet in warm water with a temperature of 103 $^0$F once for a period of 15 minutes.

### Fever

Fever is referred as unusually high body temperature is above $37^0$C ($98.6^0$F).

In this study, fever refers to rise in body temperature of child ranging from $99^0$ F - 103 $^0$ F.

### Children

The United Nations Convention on the Rights of the Child defines child as "a human being below the age of 18 years".

In this study child refers to the persons between 4-14 years of age with hyperthermia or who had developed fever during their period of hospitalization.

## Assumptions

- Warm water foot bath therapy has an influence on body temperature.
- Warm water foot bath therapy has no potential side effect on children with hyperthermia.

- Warm water foot bath therapy is a simple and cost effective measure to reduce the level of temperature among children with hyperthermia.

## Delimitations

- The study was delimited to children with hyperthermia who were admitted in Masonic Medical trust Hospital at Coimbatore.
- Data collection period was limited to 1month.

## Projected Outcomes

- The study will help the nurses to identify the effectiveness of warm water foot bath therapy on level of temperature among children with hyperthermia.
- The study findings will help the nurses to implement warm water foot bath therapy to reducing the level of temperature among children with hyperthermia.
- The study findings will enable the nurses to advice the practice of warm water foot bath as an intervention among children with hyperthermia in reducing the level of temperature.
- The study finding will help the nurses to motivate the caregivers to practicing of warm water foot bath therapy to reducing the level of temperature among children with hyperthermia.
- The study finding will help to reducing the level of temperature of children with hyperthermia.

# CHAPTER II

# REVIEW OF LITERATURE

Review of literature is an important step in the improvement of any research project. It helps the researcher to analyze about the topic and describe methods of inquiry used in previous work including the success and shortcomings. Polit and Hungler (2004) defined literature review as ‘‘critical summary of research on a topic of interest, often prepared to put a research problem in context’’.

Review of literature was organized as follows:

- Studies related to hyperthermia among children.
- Studies related to effectiveness of warm water foot bath therapy.
- Studies related to effectiveness of warm water footbath therapy on hyperthermia among children.

## Studies Related To Hyperthermia Among Children.

Rahman Akmm, Ahamad M(2014) conducted a study on prevalence of fever among children in semi urban area of Bangladesh by adopting a randomized sampling method. The study revealed that prevalence of fever among children is found to be 72.6%.

Gholamreze Solimani, Elham Shafigji Shahri (2014) conducted a study on evaluate the common causes of fever of unknown origin in 1100 children aged 3 months to 15 years. The study revealed that the common causes were infectious

diseases (55.1%), collagen vascular (4.6%), neoplasm (6.7%), miscellaneous (23.3%) and undiagnosed (10.3%). The study concluded that most fever of unknown origin result from a typical presentation of common diseases like Tuberculosis, Salmonelosis, Brucellosis and Pneumonia.

Mazyanga Lucy Mazaba- Liwewe, Selu Siziya (2014) conducted a study on prevalence of dengue fever specific immunoglobulin G antibodies in Western and North Western provinces of Zambia among 3624 persons by adopting the randomized cluster sampling method. The study revealed that 63% children (below 5 years) were infected with dengue virus compared to those aged 45 years or older. The study provided the first evidence of dengue infection circulation in North-Western provinces of Zambia.

Athirarani M.R (2014) conducted a study to assess the effectiveness of warm sponging versus tepid sponging on temperature reduction among 345 febrile children by adopting randomized sampling technique. The study revealed that warm sponging is significantly different from tepid sponging in reducing fever. The study concluded that warm sponging was more effective for reducing temperature among children with fever.

Nathalie Bertille, Elisabeth Fournier- charriere (2013) conducted an observational national survey on parent's knowledge and practices of managing fever in children among 596 parents by adopting randomized sampling technique. The study revealed that parent's knowledge and practices related to managing fever symptoms in children frequently differ from recommendations. The study concluded

that targeted health education interventions are needed to effectively manage symptoms of fever in children.

Cynthia Lewis, Josh Olinick, Kyndall L Boyle (2013) conducted a study to compare the efficacy of different cooling methods to reduce fever among 50 ICU patients with fever in Netherlands. The study concluded that temperature decline was significantly higher in cooling with water circulating blankets, gel pads and intravascular cooling, when compared to conventional cooling and air circulating blankets.

Jacob Nonvignon, Justice Nonvignon (2012) conducted a study on socioeconomic status and the prevalence of fever among 38,990 children aged below five years in Sub-Saharan African countries. A multi-level random effect logistic model was fitted to examine the socioeconomic factors that prevalence of fever in the weeks preceding the survey. This study concluded that 85% of children have fever in Ghana, Nigeria.

Samah W, Masa M Nabuls (2011) conducted a cross sectional survey to identify parent's belief and practice regarding childhood fever management among 402 parents by adopting randomized sampling technique. The study revealed that parent's believes that could cause harmful effect if left untreated. The study concluded that parent's require reliable evidence based information about the care of feverish children.

Leger A,Smith D. Pilates,Rydeard R (2010) conducted an experimental study to evaluate the effectiveness of tepid sponging among 40 children aged 5 months to 5 years with fever by adopting randomized sampling technique. The study revealed that sponge bath subjects cooled faster during first hour but there was no significant temperature difference between two study groups. On the other hand subjects in the sponge bath group had significantly higher discomfort scores due to shivering as a result of rapid cooling in cold sponging. The study concluded that tepid sponging was effective for reducing temperature but it was producing more discomfort.

Yadav P, Johi P, Gupta J (2008) conducted a study on prevalence of rheumatic fever among 9526 school children aged 5-16 years old by adopting a randomized sampling method. The study revealed that prevalence of rheumatic fever among school children in Indore district is found to be 65.3%. The study concluded that the prevalence of rheumatic fever has been increased at recent years.

Emmanuel C, Uttah, S. E.Osim (2008) conducted a study on four year longitudinal assessment of prevalence of typhoid fever among children by adopting randomized sampling method. The study revealed that prevalence of typhoid fever among male patient is found to be 58.0% and females (68.2%). The study concluded that the prevalence of typhoid fever higher among females than among males.

Walsah A M, Edwards H E (2006) conducted quantitative study to assess the knowledge, attitude and practices on management of child hood fever among 30 parent's by adopting purposive sampling technique. The study result revealed that majority of the parents had inadequate knowledge and unfavorable attitude regarding

management of child hood fever. The study concluded that there is a need to educate the parents regarding management of childhood fever.

Trautner B W et al (2006) conducted a study to evaluate the risk of serious bacterial infection among 996 febrile children by adopting randomized sampling technique. The study revealed that majority of children with fever has either self limited virus infection or a recognizable source of bacterial infection. The study concluded that serious bacterial infections that occur in children 3-36 months of age include meningitis, pneumonia and focal skin infection.

Corinna Storz, Michael Meindl (2005) conducted the study on prevalence of fever among children in Tanzania. During the period from 2002-2004 door to door studies with supplementary data collection were conducted in there different area of Tanzania. The study revealed that overall 166 children between 2 month and 7 years with a prevalence rate of 20.5/1000 met the criteria for fever.

Suarez L, Felkner M, Hendricks K (2005) conducted a study to identify the effect of fever, febrile illnesses and heat exposures on the risk of neural tube defects in a Texas-Mexica border population by adopting randomized sampling technique. The study concluded that maternal hyperthermia, febrile illness and heat exposures may produce risk of neural tube defect in their offspring.

## Studies Related to warm water footbath therapy

BehlR.K, Kashyapm MalaySarkar S,(2013) conducted a study on physiological effects of mild foot bath at Graduate School of Health and Welfare,

Japan among 31 students by adopting non probability convenient sampling technique. The study revealed that subcutaneous blood flow increased in the lower limb during the foot bath. The study concluded that two- thirds of subjects experienced a true rest as well as mental relaxation during the foot bath.

Soumia Susan Sam (2012) conducted a study to assess the effectiveness of foot bath therapy on fatigue among 30 patient with chronic renal failure by adopting randomized sampling technique. The study revealed that there was a significant reduction in the fatigue among patient with chronic renal failure. The study concluded that foot bath therapy was reducing the fatigue among patient with chronic renal failure.

Hilton R, Meibell E.M (2011) conducted a study to evaluate the effects of foot bathing on autonomic nerve and immune function among eleven healthy female volunteers aged 22-24 years. The study concluded that Foot bathing with mechanic stimulation produced significant changes in measured autoimmune responses, indicating shift to increased Para sympathetic and decreased sympathetic activity and significant increase in WBC count and NK cell cytotoxicity, suggesting an improved immune status.

Boel M, Gracchi H, Vander Ent, VandereLaag C K, (2010), conducted a longitudinal study to assess the effectiveness of warm water foot bath therapy on relieving fatigue and insomnia problems among 50 clients undergoing chemotherapy by adopting purposive sampling technique. The study revealed that there was significant reduction in fatigue and improvement in sleep quality from second session

of chemotherapy.The study concluded that warm water foot bath therapy was more effective for relieving fatigue and insomnia problems among client with chemotherapy.

## Studies related to Effectiveness of warm water foot bath therapy on hyperthermia among children

Ishita Mandal, Sunita Datta, Nargis Ahmed (2014) conducted a quasi-experimental study to evaluate the effectiveness of warm water foot bath therapy among 60 children with fever by adopting non probability purposive sampling technique. The study revealed that there was a reduction in level of temperature after giving warm water foot bath therapy. The study concluded that warm water foot bath therapy was more effective in reducing level of temperature among children with fever.

Maria Gradin (2012) conducted a study in effectiveness of warm water foot bath therapy and antipyretic drugs verses only antipyretic drug in the management of fever among 150 children by adopting the randomized control trial. The result revealed that the reduction of body temperature in the warm water foot bath therapy and antipyretic group was significantly faster than only antipyretic group. The study concluded that warm water foot bath therapy was effective for reduction of level of temperature among children.

Selva Kumari R (2011) conducted a quasi experimental study by usingone group pre and post test design on effect of hot water foot bath therapy among 60 clients with fever. The study revealed that there was a significant reduction in

temperature after application of hot water foot bath therapy. The study concluded that hot water foot bath therapy is effective in reducing level of temperature among clients with fever.

Sindhu Joseph (2011) conducted a study to assess the effectiveness of warm water foot bath therapy on level of temperature among 40 children aged 6-14 years with fever by adopting purposive sampling technique. The study revealed that there was a significant reduction of temperature among children with fever. The study concluded that warm water foot bath therapy was effective in reduction of body temperature in children aged 6-14 years during fever and it enhances rapid reduction of increased body temperature along with standard care than paracetamol.

Macharen J.E (2010) conducted a study to evaluate the effect of warm water foot bath therapy to reduce the fever among 60 children by adopting the purposive sampling technique. The study revealed that there was significant difference in reduction of temperature after application of warm water foot bath therapy in experimental and control group. The study concluded that warm water therapy was highly effective in patient with fever.

Corrard F (2007) conducted a study to evaluate the effectiveness of luke warm water bathing and antipyretic treatment versus antipyretic treatment among 100 children with fever by adopting randomized sampling technique. The study revealed that there is a significant difference between the luke warm water bathing with antipyretic treatment group and antipyretic treatment group. The study concluded that luke warm water bathing is more effective for reducing temperature among children with fever.

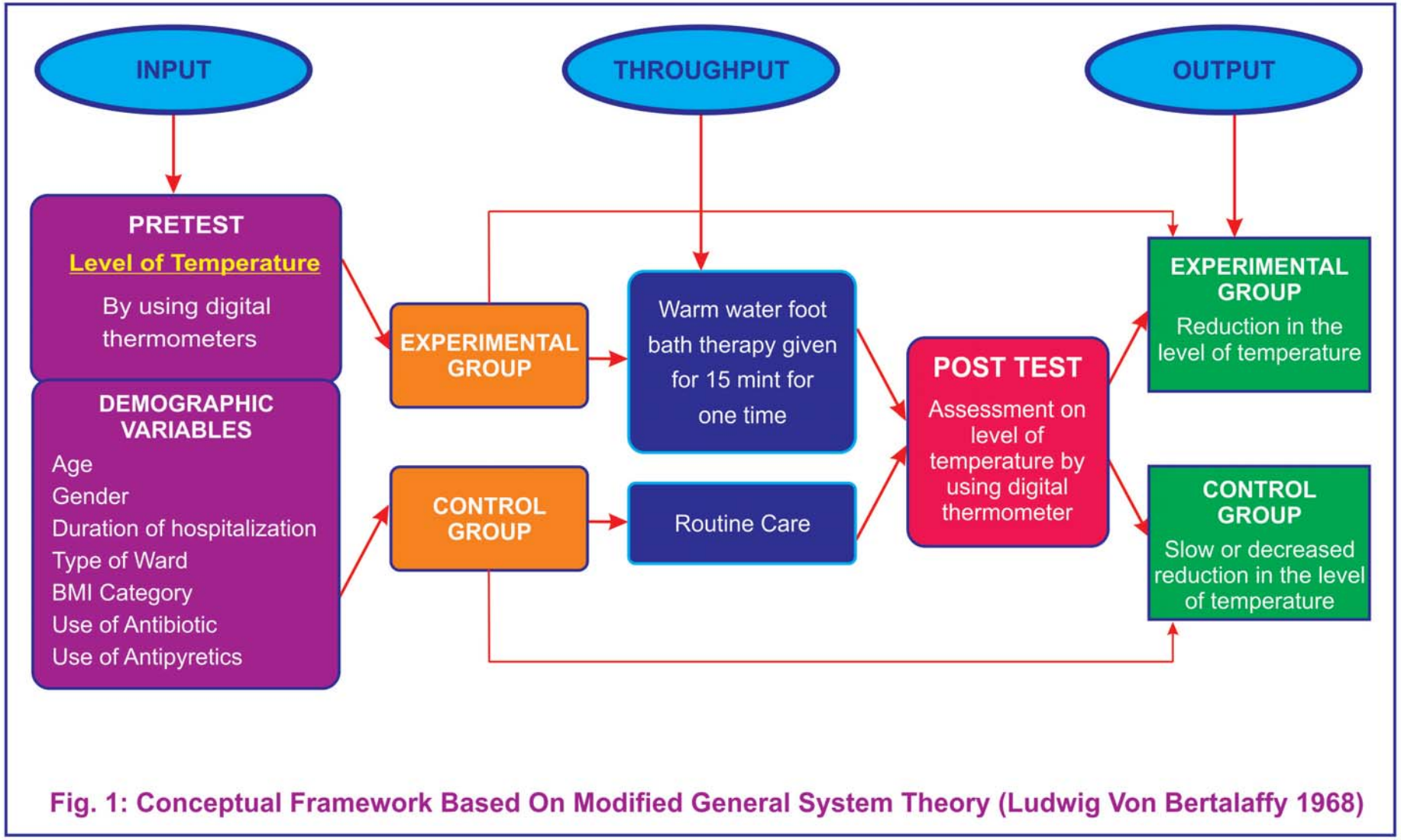


**Fig. 1: Conceptual Framework Based On Modified General System Theory (Ludwig Von Bertalaffy 1968)**

# CHAPTER III

# RESEARCH METHODOLOGY

Methodology deals with the research approach, research design, setting of the study, population, criteria for selection of sample, sample size, sampling technique, description of tool, scoring procedure, data collection procedure, procedure for data analysis and protection of human rights.

## Research Approach

Polit and Hungler, (2004) defined the research approach as “a general set of orderly discipline procedure used to acquire information”.

The research approach used for this study was quantitative evaluative approach to evaluate the effectiveness of warm water foot bath therapy on level of temperature among children with hyperthermia.

## Research design

Poilt and Hungler, (2004) defined research design as “overall plan for addressing a research questions, including specification for enhancing the study integrity”.

Quasi experimental pre and post test design with control group was chosen for the study.

The diagrammatic representation of the research design is given as follows:

| Group | Pre- test | Intervention | Post- test |
|---|---|---|---|
| Experimental Group(E) | $O_1$ | X | $O_2$ |
| Control group | $O_3$ | - | $O_4$ |

Key

$O_1$, $O_3$ :Pre-test assessment of level of temperature in experimental group and Control group respectively.

$O_2$,$O_4$ :Post-test assessment of level of temperature in experimental group Control group respectively.

X : Warm water foot bath therapy for 15 minutes once a day.

$O_2 - O_1$

$O_4 - O_3$ } Effectiveness of warm water foot bath therapy on level of temperature.

$O_2 - O_4$

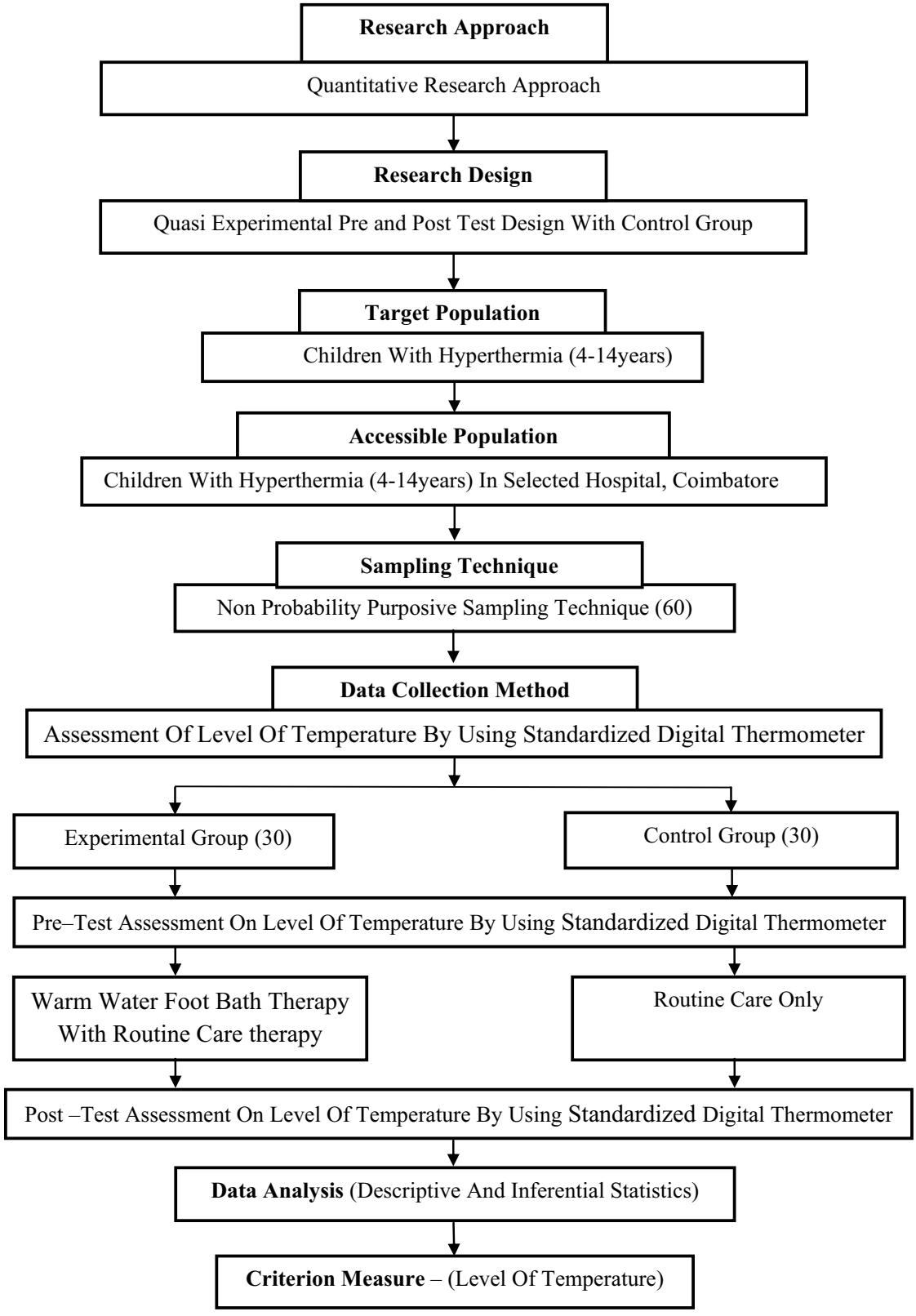


Figure 2: The Schematic Representation of Research Methodology.

## Variables

Variable is a measurable or potentially measurable component of an object or event that may fluctuate in quantity or quality or that may be different in quantity or quality from one individual object or event to another individual object or event of the same general class.

### Independent variable

The independent variable is the variable that is controlled and manipulated by the experimenter.

In this present study the independent variable is warm water foot bath therapy given for 15 minutes once a day for children with hyperthermia.

### Dependent variable

The dependent variable is the variable that is measured by the experimenter.

In this present study the dependent variable is level of body temperature.

### Demographic variable

Age, gender, duration of hospitalization, type of ward, BMI category, use of antibiotics and use of antipyretics.

## Setting of the Study

Polit and Hungler, (2001) stated that the physical location and condition in which data collection has taken place in a study is the setting of the study.

The study was conducted in Masonic Medical Trust Hospital at Coimbatore. The Masonic Hospital is a 150 bedded hospital with general ward, private ward, PICU, NICU, operation theatre, post operative ward, laboratory, and pharmacy department.

In this study the samples were selected from general ward and private ward.

## Population

According to Polit and Hungler, (2005) "A population is the entire aggregation of cases in which a researcher is interested".

In this study the target population was children with hyperthermia. The accessible population for this study was 60 children with hyperthermia admitted in Masonic Medical Trust Hospital at Coimbatore.

## Sample

According to Polit and Hungler (2005) "the sample consists of a sub set of population selected to participate in a research study".

The sample size for the study was 60. The subsets were selected in Masonic Medical Trust Hospital at Coimbatore.

## Sampling Technique

According to Polit and Hungler (2005) "sampling technique is the process of selecting a portion of the population to represent the entire population".

The samples of this study were selected by using non probability purposive sampling technique which means, selection of children who are having hyperthermia. 30 samples were selected separately for experimental and control group based on inclusion criteria and exclusion criteria.

## Criteria for Sample Selection

### Inclusion Criteria

The study includes:

1. Both male and female children between the age group of 4 to 14 years.
2. Children admitted with hyperthermia whose temperature ranges between $99^{\circ}$F- $103^{\circ}$F.
3. Whose parents are willing to participate their children in the study.
4. Children who can able to understand Tamil or English.

### Exclusion criteria:

The study excludes the children who have:

1. Peripheral vascular disorder with or without loss of sensation.
2. Unconsciousness.
3. Post-operative children.

## Description of tool

Treece and Treece (1986) emphasized that the instrument selected in research should as far as possible be the vehicle that could best obtain data for drawing conclusion pertinent to the study.

Part A

It consisted of demographic variables of children that includes Age, Gender, Duration of hospitalization, Type of ward, BMI category, Use of antipyretics, Use of antibiotics.

Part B

Assessment of level of body temperature. It consist of standardized digital thermometer for measuring the body temperature.

## Scoring Procedure

| | | |
|---|---|---|
| 94.5 -99°F | - | Normal |
| 99- 100°F | - | Low Pyrexia |
| 100.2-103°F | - | Moderate Pyrexia |

## Intervention

Samples were explained regarding the sequence of procedure and the required articles were assembled at the bedside. Sitting position was provided to the child. Pre test level of body temperature was assessed by using standardized digital thermometer both for experimental and control group. Warm water foot bath was prepared by investigator with enough warm water to cover the ankles. Water temperature was checked with lotion thermometer and carefully immersed the client's feet into the warm water with the support for 15minutes.Child was completely wrapped with sheet and blanket, leaving the head and neck exposed. Warm water was periodically added to the foot bath to maintain heat, investigators hand was placed between the warm water being poured and the client feet (to avoid burning the feet).Lift the feet out of the warm water. Post test level of body temperature was checked after 20 minutes.

## Validity of the Tool

According to Nancy Burns (2005), "Validity is the determination of the extent to which an instrument reflect the abstract construct being examined"

The content validity of the tool was evaluated by 5 Nursing experts and 2 Medical experts in the field of Paediatrics. The tool was found to be valid.

## Reliability of the tool

According to Polit and Hungler (2004) "reliability of an instrument is the consistency with which it measures the target attribute".

In this study, standardized digital thermometer was used to assess the level of body temperature.

## Pilot study

Polit and Beck (2004) denote that pilot study is a small scale version, or trial run done in preparation for a major study.

In order to test the feasibility, relevance and practicability of the study, pilot study was conducted among 10 children with hyperthermia in Meenakshi Hospital at Coimbatore. The study finding revealed that the obtained 't' value for effectiveness of warm water foot bath therapy on level of temperature was 7.125. Which was found to be significant at $p<0.05$ level. The pilot study results showed that it was feasible to conduct the study.

## Data collection procedure

A prior permission was obtained from authority of Masonic medical trust hospital. The study was conducted for a period of 6 weeks. Informed written consent

was obtained from the parents of the samples. On day, pre test was done from the samples by using structured interview questionnaire and by using digital thermometer to measure the level of temperature for both experimental and control group. It is followed by administration of warm water foot bath therapy once for 15 minutes for experimental group only. Post test was obtained after 20 minutes of the intervention from the experimental and control group.

## Plan for data analysis

The demographic variables were analyzed by using descriptive measures (frequency and percentage). The level of body temperature was analyzed by using descriptive statistics (mean, standard deviation). The effectiveness of warm water foot bath therapy on level of temperature among children with fever was analyzed by using inferential statistics (paired‘t’ test and independent t test. Association between level of temperature among children with fever and their selected demographic variables were analyzed by using $\chi^2$ tests.

## Protection on human rights

The study was conducted after the approval of managing director of Masonic medical trust hospital and research committee of the college of nursing. The nature and purpose of the study was explained to the care personnel involved. The informed written consent was obtained from the care personnel of participants. The anonymity of the sample was maintained throughout the study. Warm water foot bath therapy was also taught to the control group after the post test to overcome the ethical issues.

# CHAPTER IV

## DATA ANALYSIS AND INTERPRETATION

This chapter deals with the analysis and interpretation of the collected data from 60 children with hyperthermia to assess the effectiveness of warm water foot bath therapy on level of temperature among children with hyperthermia.

Polit and Beck (2003) has noted data analysis as "the systematic organization, synthesized research data and testing of research hypothesis using those data"

Denise F. Polit (2011) defined data as, "The piece of information obtained in a study".

The analysis and interpretation of data of the study are based on data collected through standardized digital thermometer to assess the level of temperature among 60 children with hyperthermia. The study findings are presented in sections as follows:

- Section I : Data on demographic variables of children with hyperthermia.
- Section II : Data on level of temperature among children with hyperthermia.
- Section III : Data on effectiveness of warm water foot bath therapy on level of temperature among children with hyperthermia.
- Section IV : Data on association between levels of temperature among Children with hyperthermia and their selected demographic variables.

## SECTION I : DATA ON DEMOGRAPHICVARIABLESOF CHILDREN WITH HYPERTHERMIA

Table: 1.1

Frequency and Percentage Distribution of Demographic Variables Among Children With Hyperthermia In Experimental Group. N=30

| S.No | Demographic variables | Frequency (f) | Percentage (%) |
|---|---|---|---|
| 1 | Age of child( in years) | | |
| | a. 4-9 years | 24 | 80 |
| | b. 10-14 years | 6 | 20 |
| 2 | Gender | | |
| | a. Male | 18 | 60 |
| | b. Female | 12 | 40 |
| 3 | Duration of hospitalization | | |
| | a. One day | 0 | 0 |
| | b. Two days | 21 | 70 |
| | c. Three days | 6 | 20 |
| | d. More than three days | 3 | 10 |
| 4 | Type of ward | | |
| | a. General ward | 9 | 30 |
| | b. Private | 21 | 70 |
| 5 | BMI Category | | |
| | a.<18.5 -Under weight | 23 | 77 |
| | b.18.5- 25 - Normal weight | 7 | 23 |
| | c. >25 - Over weight | 0 | 0 |
| 6 | Use of antipyretics | | |
| | a. Yes | 30 | 100 |
| | b. No | 0 | 0 |



(Contd..)

| S.No | Demographic variables | Frequency (f) | Percentage (%) |
|---|---|---|---|
| 7. | Use of antibiotic<br>a. Yes<br>b. No | <br>24<br>6 | <br>80<br>20 |

Table 1 reveals that regarding age, majority 24 (80%)of the children belong to 4-9 years and 6 (20%) belong to the age group 10-14years.

Regarding gender 18 (60%) children were males and 12(40%) were females.

Regarding the duration of hospitalization 21(70%) of children were hospitalized for 2 days, 6(20%) of children were hospitalized for 3 days and 3(10%) of children were hospitalized for more than three days.

Regarding type of ward 9 (30%) of children admitted in general ward, 21(70%) of children admitted in private ward.

Regarding BMI category 23 (77%) of children were are under weight, 7 (23%) of children were normal weight.

Regarding use of antipyretics all 30(100%) of children were undergone the antipyretic treatment.

Regarding use of antibiotics 24(80%) of children got antibiotics treatment 6(20%) of children were not getting antibiotic treatment.

Table: 1.2

Frequency and Percentage Distribution of Demographic Variables Among Children with Hyperthermia In Control Group.

N= 30

| S.No | Demographic variables | Frequency (f) | Percentage (%) |
|---|---|---|---|
| 1 | Age of child( in years) | | |
| | a. 4-9 years | 30 | 100 |
| | b. 10-14 years | 0 | 0 |
| 2 | Gender | | |
| | a. Male | 18 | 60 |
| | b. Female | 12 | 40 |
| 3 | Duration of hospitalization | | |
| | a. One day | 6 | 20 |
| | b. Two days | 12 | 40 |
| | c. Three days | 6 | 20 |
| | d. More than three days | 6 | 20 |
| 4 | Type of ward | | |
| | a. General ward | 15 | 50 |
| | b. Private | 15 | 50 |
| 5 | BMI Category | | |
| | a. <18.5 -Under weight | 27 | 90 |
| | b. 18.5- 25 - Normal weight | 3 | 10 |
| | c. >25 -Over weight | 0 | 0 |
| 6 | Use of antipyretics | | |
| | a. Yes | 30 | 100 |
| | b. No | 0 | 0 |

(Contd..)

| S.No | Demographic variables | Frequency (f) | Percentage (%) |
|---|---|---|---|
| 7. | Use of antibiotic<br>a. Yes<br>b. No | <br>20<br>10 | <br>67<br>33 |

Table 1 reveals that regarding age, 30 (100%) of the children belong to 4-9years.

Regarding gender 18 (60%) children were males and 12(40%) were females.

Regarding the duration of hospitalization 6 (20%) of children were hospitalized for 1 days, 12(40%) of children were hospitalized for 2 days. 6(20%) of children were hospitalized for 3 days. 6(20%) of children were hospitalized for more than three days.

Regarding type of ward 15(50%) of children were admitted in general ward, 15(50%) of children were admitted in private ward.

Regarding BMI category 27 (90%) of children were under weight, 3(10%) of children were normal weight.

Regarding use of antipyretics all 30(100%) of children had the antipyretics treatment.

Regarding use of antibiotics 20(67%) of children got antibiotics treatment 10(33%) of children were not getting antibiotic treatment.

## SECTION II: DATA ON LEVEL OF TEMPERATURE AMONG CHILDREN WITH HYPERTHERMIA.

Table: 2.1

Frequency and Percentage Distribution on Level of Temperature Among Children With Hyperthermia In Experimental Group

N=30

| S.No | Level of temperature | Pre-test | | Post-test | |
|---|---|---|---|---|---|
| | | N | % | N | % |
| 1 | Normal | 0 | 0 | 19 | 63 |
| 2 | Low pyrexia | 3 | 10 | 11 | 37 |
| 3 | Moderate pyrexia | 27 | 90 | 0 | 0 |
| 4 | High pyrexia | 0 | 0 | 0 | 0 |

Table 2.1 shows that among children with hyperthermia in experimental group 27(90%) had moderate pyrexia and 3(10%) had low pyrexia during pre-test. Majority of the children 11 (37%) had low pyrexia and 19(63%) had normal temperature during post-test.

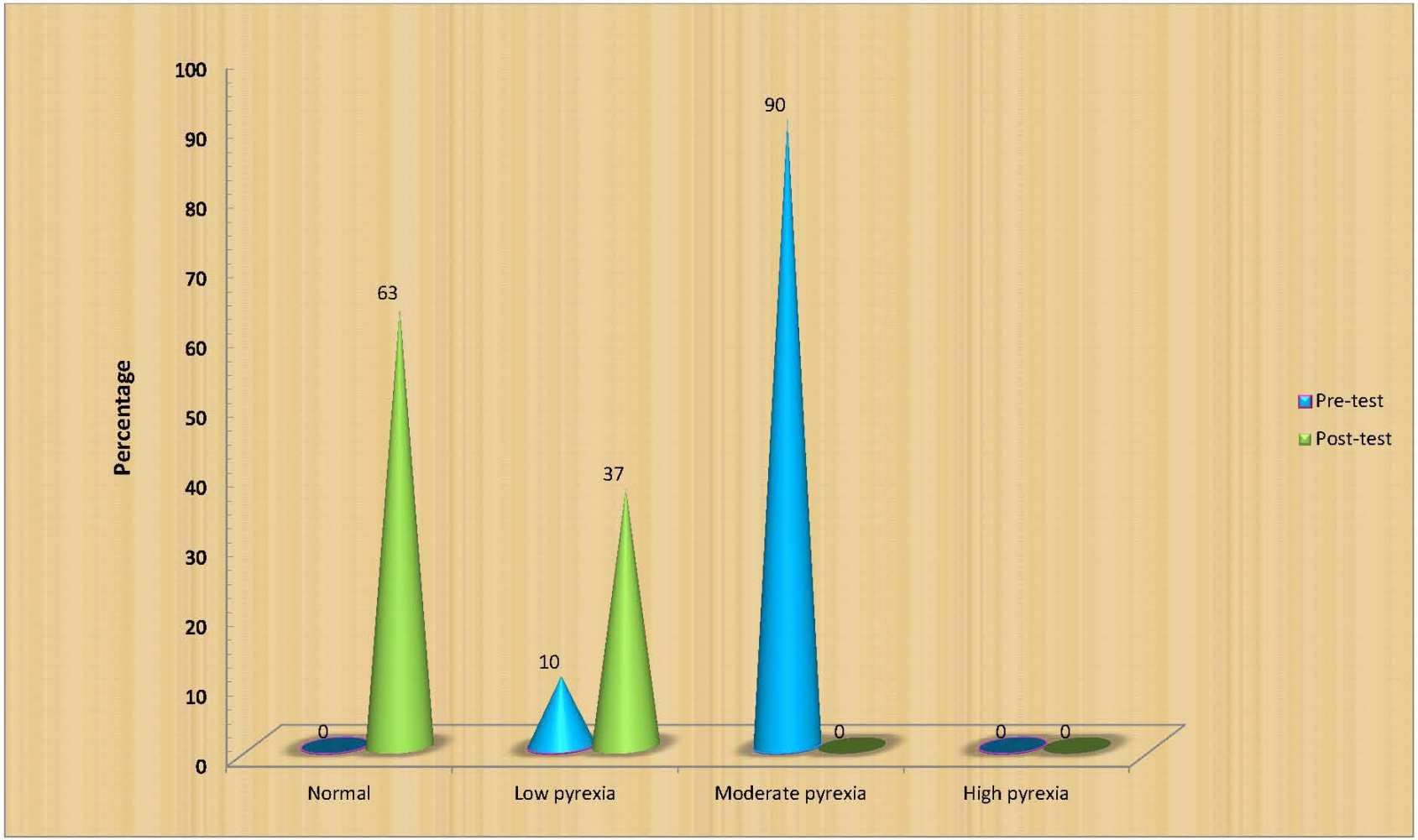


**Figure- 3** Level Of Temperature Among Children With Hyperthermia In Experimental Group

Table: 2.2

Frequency and Percentage Distribution on Level of Temperature Among Children With Hyperthermia In Control Group

N=30

| S.No | Level of temperature | Pre-test | | Post-test | |
|---|---|---|---|---|---|
| | | N | % | N | % |
| 1 | Normal | 0 | 0 | 0 | 0 |
| 2 | Low pyrexia | 8 | 27 | 12 | 40 |
| 3 | Moderate pyrexia | 22 | 73 | 18 | 60 |
| 4 | High pyrexia | 0 | 0 | 0 | 0 |

Table 2.2 shows that among children with hyperthermia in control group 8(27%) had low pyrexia and 22 (73%) had moderate pyrexia during pre-test. Majority of the children 12 (40%) had low pyrexia and 18(60%) had moderate pyrexia during post-test.

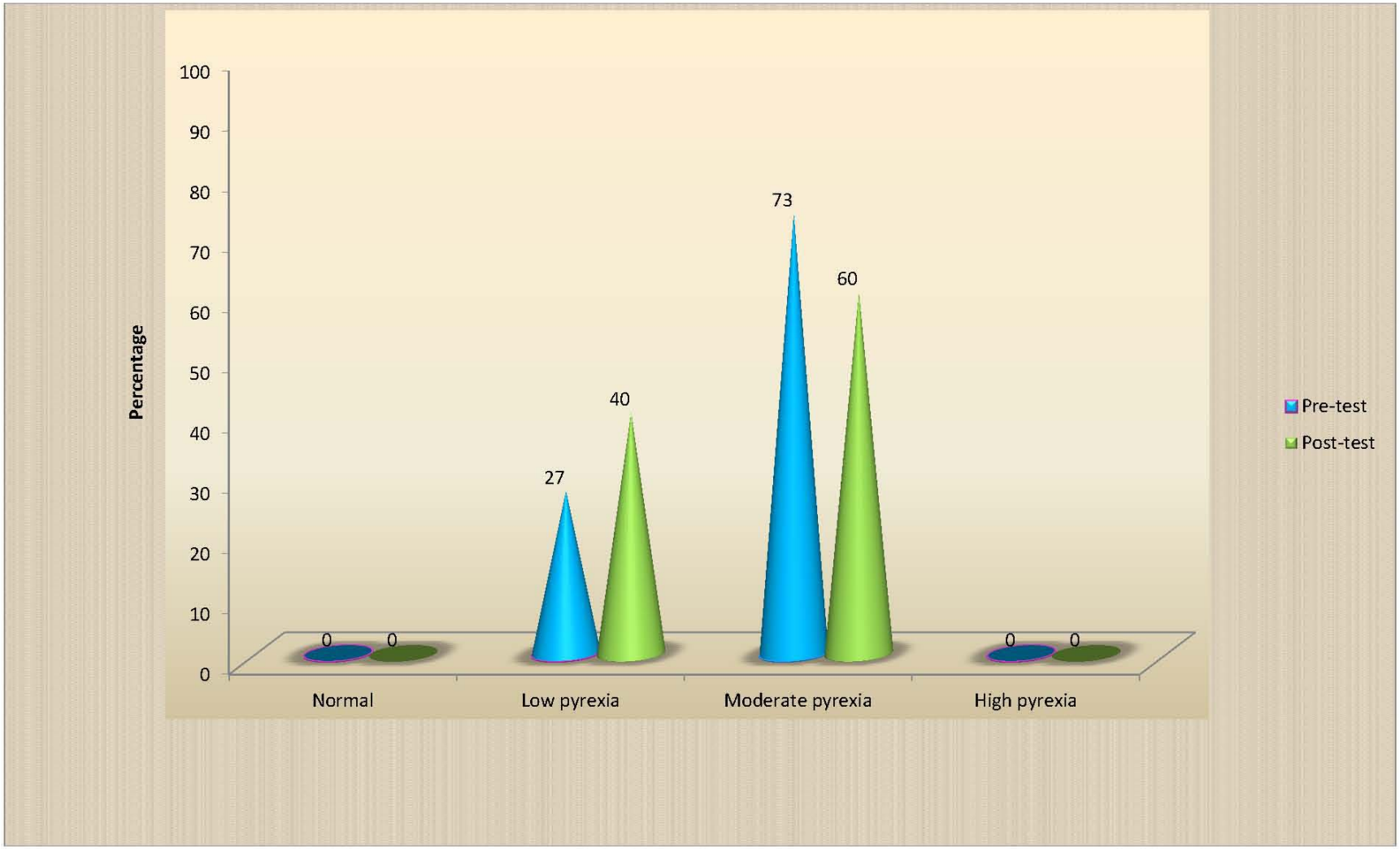


**Figure-4:**Level Of Temperature Among Children With Hyperthermia In Control Group.

## SECTION III: DATA ON EFFECTIVENESS OF WARM WATER FOOT BATH THERAPY ON LEVEL OF TEMPERATURE AMONG CHILDREN WITH HYPERTHERMIA

Table: 3.1

Mean, Standard Deviation, Mean Difference and 't' Value on Pre test& Post test Level of Temperature Among Children With Hyperthermia In Experimental Group.

N=30

| S.NO. | Level of Temperature | Mean | Standard Deviation | Mean Difference | 't'Value |
|---|---|---|---|---|---|
| 1. | Pre-test | 101.81 | 1.112 | 2.91 | 17.9* |
| 2. | Post-test | 98.90 | 0.579 | | |

* - Significant at p<0.05 level

Table 3.1 reveals that among experimental group, the mean pre-test score 101.81 with standard deviation 1.112 was more than the mean post test score 98.90 with standard deviation 0.579. The calculated mean difference was 2.91 and the obtained't' value 17.9 was highly significant at p<0.05 level.


**Figure-5:** Mean Value On Pre-Test And Post-Test Level Of Temperature Among Children With Hyperthermia In Experimental Group.

Table: 3.2

Mean, Standard Deviation, Mean Differenceand‘t’ Value on Pre test&Post test Level of Temperature Among Children With Hyperthermia In Control Group.

N=30

| S.NO. | Level of Temperature | Mean | Standard Deviation | Mean Difference | ‘t’Value |
|---|---|---|---|---|---|
| 1. | Pre-test | 100.70 | 0.819 | 0.39 | 10.7* |
| 2. | Post-test | 100.30 | 0.716 | | |

* - Significant at p<0.05 level

Table 3.1 reveals that among control group, the mean pre-test score 100.70 with standard deviation 0.819 was more than the mean post test score 100.30 with standard deviation 0.716. The calculated mean difference was 0.39 and the obtained‘t’ value10.7 was also significant at p<0.05 level.

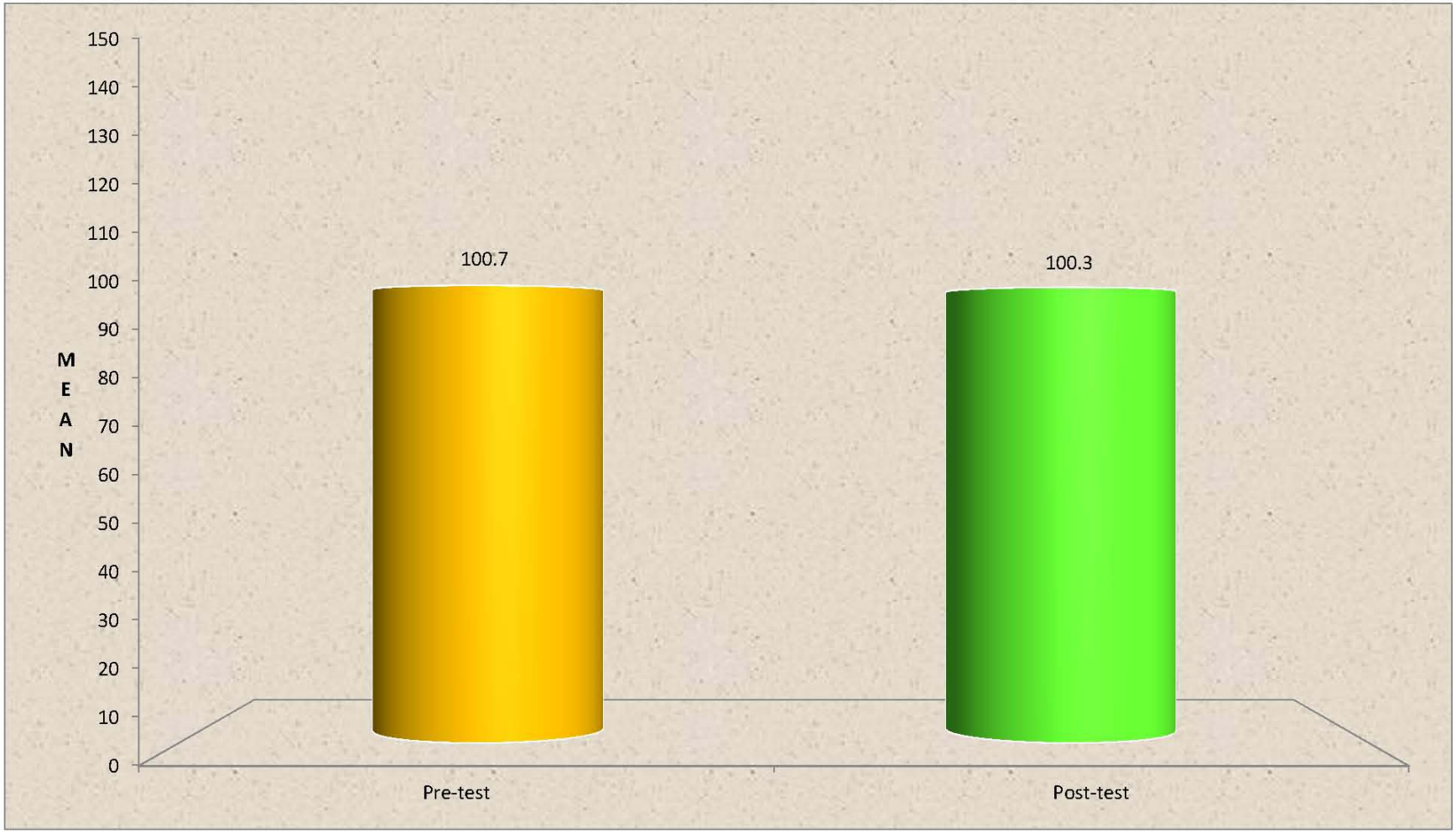


**Figure-6:**Mean Value On Pre-Test Level Of Temperature Among Children With Hyperthermia In Control Group.

Table: 3.3

Mean, Standard Deviation, Mean Difference and 't' Value on Post test Level of Temperature Among Children With Hyperthermia In Experimental and Control Group.

N=60

| S.NO. | Level of Temperature | Mean | Standard Deviation | Mean Difference | 't' Value |
|---|---|---|---|---|---|
| 1. | Experimental group | 98.90 | 0.579 | 1.4 | 8.20* |
| 2. | Control group | 100.30 | 0.719 | | |

* - Significant at p<0.05 level

Table 3.1 reveals that among experimental group, the mean post-test score was 98.90 with standard deviation 0.579. Among control group, the mean post-test score was 100.30 with standard deviation0.716. The calculated mean difference was 1.4 and the obtained 't' value 8.20 was highly significant at p<0.05 level.

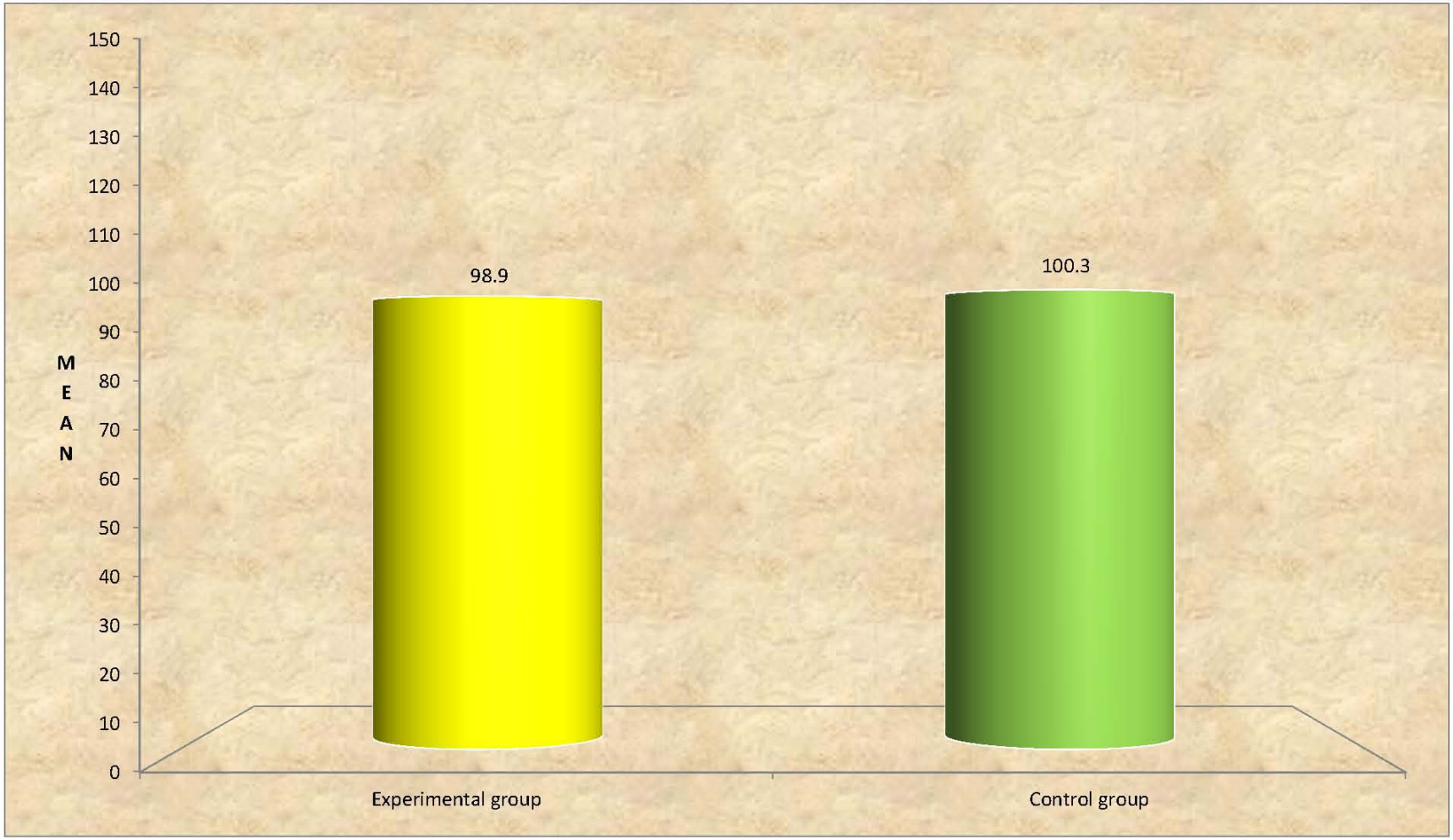


**Figure-7:** Mean Value On Post-Test Level Of Temperature Among Children With Hyperthermia In Experimental And Control Group.

## SECTION 1V: DATA ON ASSOCIATION BETWEEN LEVEL OF TEMPERATURE AMONG CHILDREN WITH HYPERTHERMIA AND THEIR SELECTED DEMOGRAPHIC VARIABLES

Table: 4.1

Frequency, Percentage and $\chi^2$ Distribution on Level of Temperature Among Children With Their Selected Demographic Variables In Experimental Group.

N=30

| Sl.No | Demographic variables | Level of temperature | | | | $\chi^2$ Value |
|---|---|---|---|---|---|---|
| | | Normal | | Low pyrexia | | |
| | | N | % | N | % | |
| 1. | Age (in years) | | | | | |
| | a. 4-9 years | 15 | 50 | 9 | 30 | 0.035 NS |
| | b. 10-14 years | 4 | 13 | 2 | 7 | df=1 |
| 2. | Gender | | | | | |
| | a. Male | 12 | 40 | 6 | 20 | 0.215 NS |
| | b. Female | 7 | 23 | 5 | 17 | df=1 |
| 3. | Duration of hospitalization | | | | | |
| | a. One day | 0 | 0 | 0 | 0 | |
| | b. Two days | 13 | 43 | 8 | 27 | 0.061 NS |
| | c. Three days | 4 | 13 | 2 | 7 | df=3 |
| | d. More than three days | 2 | 7 | 1 | 3 | |
| 4. | Type of ward | | | | | |
| | a. General | 5 | 17 | 4 | 13 | 0. 334 NS |
| | b. Private | 14 | 47 | 7 | 23 | df=1 |

(Contd..)

| S.No | Demographic variables | Level of temperature | | | | $\chi^2$ Value |
|---|---|---|---|---|---|---|
| | | Normal | | Low pyrexia | | |
| | | N | % | N | % | |
| 5. | BMI category | | | | | |
| | a. a.<18.5-Under weight | 17 | 57 | 6 | 20 | $4.925^{NS}$df |
| | b. 18.5 -25 –Normal weight | 2 | 7 | 5 | 16 | =2 |
| | c. 25 -Over weight | 0 | 0 | 0 | 0 | |
| 6. | Use of antipyretics | | | | | |
| | a. Yes | 19 | 63 | 11 | 37 | $0^{NS}$ |
| | b. No | 0 | 0 | 0 | 0 | df=1 |
| 7. | Use of antibiotics | | | | | |
| | a. Yes | 15 | 50 | 9 | 30 | 0.034 |
| | b. No | 4 | 13 | 2 | 7 | $^{NS}$df=1 |

NS- Non significant

Table 4.1 envisages the substantive summary of $\chi^2$ analysis which was used to bring out the relationship between the levels of temperature among children with their selected demographic variables in experimental group.

With regard to age, among 4-9 years 15 (50%) had normal temperature, 9(30%) had low pyrexia. Among 10-14years, 4(13%) had normal temperature and 2(7%) had low temperature. The obtained $\chi^2$ value of 0.035 was not significant and thus stated hypothesis is not supported. So it is inferred that there is no significant association between the age and level of temperature among children with hyperthermia.

With regard to gender, among males 12 (40%) had normal temperature, and 6(20%) had low pyrexia. Among females 7(23%) had normal temperature. 5(16%) had low pyrexia. The obtained$\chi^2$ value of 0.215 was not significant and thus the stated research hypothesis is not supported. So it is inferred that there is no significant association between gender and level of temperature among children with hyperthermia.

With regard to duration of hospitalization, among children with 2 days of hospitalization 13 (43.3%) had normal temperature, 8(27%) had low pyrexia. Among children with 3 days of hospitalization 4(13%) had low pyrexia, 2(7%) had low temperature. Among children with more than three days of hospitalization 2(7%) had normal pyrexia,1(3.3%) had low pyrexia. The obtained $\chi^2$ value of 0.061was not significant and thus the stated research hypothesis is not supported. So it is inferred that there is no significant association between duration of hospitalization and level of temperature among children with hyperthermia.

With regard to type of ward, among general ward 5 (17%) had normal temperature and 4(13%) of them had low temperature. Among private ward 14(47%) had normal temperature, 7(23.3%) had low pyrexia. The obtained $\chi^2$ value 0.334was not significant and thus the stated research hypothesis is not supported. So it is inferred that there is no significant association between type of ward and level of temperature among children with hyperthermia.

With regard to BMI category, among underweight 17(57%) had normal temperature, 6 (20%) had low pyrexia. Among normal weight 2(7%) of them have normal temperature, 5(16%) had low pyrexia. The obtained $\chi^2$ value 4.925was not significant and

thus the stated research hypothesis is not supported. So it is inferred that there is no significant association between BMI category and level of temperature among children with hyperthermia.

With regard to use of antipyretics, among 19(63%) had normal temperature, 11 (37%) had low pyrexia. The obtained $\chi^2$ value 0 was not significant and thus the stated research hypothesis is not supported. So it is inferred that there is no significant association between use of antipyretics and level of temperature among children with hyperthermia.

With regard to use of antibiotics, among 15(50%) had normal temperature, 9(30%) had low pyrexia. 4(13%) had normal temperature and 2(7%) had low pyrexia. Among 3 children was not undergoing antibiotics treatment. The obtained $\chi^2$ value 0.034 was not significant and thus the stated research hypothesis is not supported. So it is inferred that there is no significant association between use of antibiotics and level of temperature among children with hyperthermia.

It was inferred that, there is no significant association between level of temperature among children with their selected demographic variables in experimental group such as age, gender, duration of hospitalization, type of ward, BMI category, use of antipyretics and use of antibiotics.

hypothesis is not supported. So it is inferred that there is no significant association between gender and level of temperature among children with hyperthermia.

With regard to duration of hospitalization, among children with one day of hospitalization 3(10%) had low temperature and 3(10%) had moderate pyrexia. Among children with 2 days of hospitalization 3(10%) had low temperature and 9(30%) had moderate pyrexia. Among children with 3 days of hospitalization 3(10%) had low pyrexia and moderate pyrexia. More than three days of hospitalization 3(10%) had low pyrexia and 3(10%) had moderate pyrexia. The obtained $\chi^2$ value of 1.875 was not significant and thus the stated research hypothesis is supported. So it is inferred that there is a significant association between duration of hospitalization and level of temperature among children with hyperthermia.

With regard to type of ward, among general ward 3(10%) had low pyrexia and 12(40%) of them had moderate pyrexia. Among private ward 9(30%) had low pyrexia, 6(20%) had moderate pyrexia. The obtained $\chi^2$ value 5 was a significant and thus the stated research hypothesis is not supported. So it is inferred that there is significant association between type of ward and level of temperature among children with hyperthermia.

With regard to BMI category, among underweight 9(30%) had low pyrexia, 18(60%) had moderate pyrexia. Among normal weight 3 (10%) of them have low pyrexia. The obtained $\chi^2$ value 3.808 was not significant and thus the stated research hypothesis is not supported. So it is inferred that there is no significant association between BMI category and level of temperature among children with hyperthermia.

With regard to use of antipyretics, among 12(47%) had low pyrexia, 18(53%) had moderate pyrexia. The obtained $\chi^2$ value 0 was not significant and thus the stated research hypothesis is not supported. So it is inferred that there is no significant association between use of antipyretics and level of temperature among children with hyperthermia.

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With regard to use of antibiotics, among 8(33.3%) had low pyrexia, 12(40%) had moderate pyrexia. 4(13%) had low pyrexia, 6(20%) had moderate pyrexia. The obtained $\chi^2$ value 0 was not significant and thus the stated research hypothesis is supported. So it is inferred that there is a significant association between use of antibiotics and level of temperature among children with hyperthermia.

It was inferred that, there is no significant association between level of temperature among children with their selected demographic variables in control group such as age, gender, duration of hospitalization, BMI category, use of antipyretics, and use of antibiotics.

# CHAPTER V

# DISCUSSION

The basic aim of this study was to evaluate the effectiveness of warm water foot bath therapy on level of temperature among children with hyperthermia in selected hospital at Coimbatore.

The study was conducted by using a quasi-experimental pretest post test design with control group. The samples were selected from the unit of general ward and private ward in Masonic Medical Trust hospital for conducting the study. The sample size was 60 among which 30 samples in experimental group and 30 samples in control group were selected by using purposive sampling techniques.

The structured self administered questionnaire was used to assess the demographic variables among children with hyperthermia. The standardized digital thermometer was used as the instrument measure the level of temperature. The demographic variables were analyzed by using descriptive measures (frequency and percentage). The responses were analyzed by using descriptive statistics (mean, frequency, percentage and SD). The effectiveness of warm water foot bath therapy was analyzed by using inferential statistics (paired 't' test, independent 't' test). Association between the levels of temperature and the selected demographical variables were analyzed by using $\chi^2$ test. Discussions on the finding were arranged based on the objectives of the study.

The first objective of the study was to assess the pre and post test level of temperature among children in experimental and control group. The study

findingsshowed that in experimental group, in the pre test 27(90%) children had moderate pyrexia, and 3 (10%) children had low pyrexia. Whereas in the post test, the majority of children 11(37%) had low pyrexia, 19(63%) children had normal temperature. In control group, in pre test 8 (27%) children had low pyrexia, 22(73%) children had moderate pyrexia. Whereas in the post test 14(80%) children had low pyrexia, 16(20%) children had moderate pyrexia. From the above finding it is clear that there has been a significant difference between pre and post test level of body temperature in children with hyperthermia.

These findings are similar to the study findings of Priscilla M S (2008) who conducted an experimental study to evaluate the effectiveness of warm water foot bath therapy on level of temperature among 100 children by adopting purposive sampling technique, which revealed that there is significant different between the mean pre and post test level of temperature in two groups.

The second objective of the study was to evaluate the effectiveness of warm water foot bath therapy on level of temperature among children with hyperthermia in experimental group.

The present study results revealed that among the experimental group, themean pre test score of temperature was 101.81 with standard deviation 1.112. Whereas the mean post test score of temperature was 98.90 with standard deviation of 0.579 and mean difference was 2.91. The obtained ‘t’ value 17.9 was significant at $p< 0.05$ level.

In the control group the mean pre test score of temperature was 100.70 with standard deviation 0.819. Whereas the mean post test score of temperature was 100.30 with a standard deviation of 0.716 and mean difference was 0.39. The obtained‘t’ value 10.7 was significant at $p< 0.05$ level.

The study shows that among experimental group, the mean post test score was 98.90 with standard deviation 0.579. Among control group, the mean post test score was 100.30 with standard deviation 0.716. The calculated mean difference was1.4 and the obtained ‘t’ value 8.20 was highly significant at $p<0.05$ level. From the above finding it is revealed that warm water foot bath therapy was more effective in reducing level of body temperature among children with hyperthermia.

The study findings are similar to the study findings of Jini Mary Mathew (2011) who conducted a quasi experimental study to assess the effectiveness of hot water foot bath therapy on temperature among 100 patients by adopting the randomized sampling technique. In this study the mean post test score was 98.85 with standard deviation 0.615 in experimental group. Among control group 101.06 with standard deviation 0.920.The calculated mean difference 2.21and the obtained ‘t’ value 10.936 was significant at $p<0.05$ level. This revealed that the hot water foot bath therapy was effective in reduction of body temperature.

The findings are also consistent to the study finding of Corrad F (2007) who conducted a study on effectiveness of luke warm water bathing among 100 children with fever. The study revealed that luke warm water bathing was effective for reducing temperature among children.

The third objective of the study was to determine the association between post test level of temperature among children with hyperthermia and their selected demographic variables in experimental group and control group.

The study findings revealed that in experimental group there was no significant association between the level of temperature among children with hyperthermia and their selected demographic variables such as age, gender, duration of hospitalization, type of ward, BMI category, use of antipyretics, and use of antibiotics.

The study findings revealed that in control group, there was a significant association between the level of temperature among children with hyperthermia and type of ward. There was no significant association between the level of temperature among children with their other selected demographic variables such as age, gender, duration of hospitalization, BMI category, use of antipyretics, use of antibiotics.

# CHAPTER VI

# SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents a brief account of the present study. It deals with the summary, conclusion and recommendations of the study. Conclusions are drawn from the findings and the implications of the results for nursing practice, nursing education, nursing research and nursing administration are stated.

## Summary

The present study was to evaluate the effectiveness of warm water foot bath therapy on reducing the level of temperature among children with hyperthermia in Masonic Medical Trust Hospital at Coimbatore.

## The objectives of the study were

- To assess the pre and post test level of temperature among children with hyperthermia in experimental group and control group.
- To evaluate the effectiveness of warm water foot bath therapy on level of temperature among children with hyperthermia in experimental group.
- To determine the association between the post test level of temperature among children with their selected demographic variables in experimental group and control group.

A quasi experimental pretest and posttest design with control group was chosen for this study without randomization.

A non-probability purposive sampling technique was adopted to select samples with inclusion criteria. The sample size was 60 among them 30 were in experimental group and 30 were in control group.

Digital thermometer was used to assess the level of bodytemperature of children with hyperthermia.

It consisted of

PART I : It consisted of demographic variables such as age, gender, duration of Hospitalization, type of ward, BMI category, use of antipyretics, use of Antibiotics.

PART II : Standardized digital thermometer was used to assess the level of body Temperature among children with hyperthermia before and after administration of warm water footbath therapy.

Data collection was done by using the structured interview questionnaire. Pre-test was done by using Standardized Digital Thermometer to measure the level of temperature for both groups. It is followed by administration of warm water foot bath therapy once for 15 minutes for experimental group. The post test was done after 20 minutes of the intervention.

## Major Study Findings:

The study findings showed that in experimental group, in the pre test 27(90%) children had moderate pyrexia, and 3 (10%) children had low pyrexia. Whereas in the post test, the majority of children 11(37%) had low pyrexia, 19(63%) children had normal temperature.

In control group, in pre test 8 (27%) children had low pyrexia, 22(73%) children had moderate pyrexia. Whereas in the post test 14(80%) children had low pyrexia, 16(20%) children had moderate pyrexia.

With regard to effectiveness of warm water foot bath therapy on level of temperature among children with hyperthermia in experimental group, the mean pre-test score of temperature was 101.81 with standard deviation 1.112. Whereas themean post test score of temperature was 98.90 with standard deviation of 0.579 and mean difference was 2.91. The obtained‘t’ value was 17.9 which was significant at $p<0.05$level.

In the control group the mean pre test score of temperature was 100.70 with standard deviation 0.819. Whereas the mean post test score of temperature was 100.30 with a standard deviation of 0.716 and mean difference was 0.39. The obtained ‘t’ value 10.7 was not significant at $p< 0.05$ level.

The comparison of the ‘t’ value of both warm water foot bath therapy with routine care and routine care revealed that warm water foot bath therapy is more effective in reducing the level of body temperature among children with hyperthermia. Hence the stated hypothesis ($H_2$) is accepted.

The calculated chi square values of for the type of ward were found to significant at $p<0.05$ level. Hence it is inferred that type of ward have significant association between the level of temperature among children with hyperthermia. Hence the stated hypothesis ($H_3$) is accepted.

## Conclusion

The main conclusion drawn from the present study was that most of the hyperthermia children had low, moderate, high temperature. After receiving the warm water foot bath therapy, level of body temperature was reduced significantly. Samples became familiar and found themselves comfortable and also expressed satisfaction. It is thus concluded that the warm water foot bath therapy is effective in reduction on level of temperature among children with hyperthermia.

## Implications of the study

According to Tolsma (1995), "the section of the research report that focuses on nursing implication usually includes specific suggestions for nursing practice, nursing education, nursing research ad nursing administration". Nursing implication for this study is enlisted below:

## Nursing Practice

Clinical nurse can:

- Appreciate the importance of warm water foot bath therapy.
- Demonstrate the procedure of warm water foot bath therapy.
- Recognize the findings of the current study which can be a baseline for providing instructions to mothers of children with hyperthermia.
- Encourage the care gives to use warm water foot bath therapy as a complementary therapy for patients with hyperthermia.
- Suggest this simple technique for preventing further complications among children with hyperthermia.

## Nursing Education

Nurse educators can:

- Teach the importance of warm water foot bath therapy for the students.
- Demonstrate the procedure of warm water foot bath therapy to the students.
- Encourage and bring into practice the warm water foot bath therapy in clinical posting.

## Nursing Researcher

Nurse researcher can

- Add to the research review about the importance of warm water foot bath therapy on level of temperature among children with hyperthermia.
- Disseminate the findings through journals and publications.
- The study findings help in expanding the scientific body of professional knowledge upon which further research can be conducted.

## Nursing Administration

Nurse administrator can:

- Organize in service education programs for the nurses on this complementary technique.
- Make cost effectiveness on the nursing care by reducing the usage of antipyretics among children with hyperthermia.
- Develop a written protocol on methods of warm water foot bath therapy implication.
- Distribute the educational pamphlets, its containing information on reducing body temperature in children with hyperthermia by warm water foot bath

therapy can given to nursing staffs and in turn taught to the parents. It helps to motivate them to develop healthy practices.

## Recommendations

- The same study can be conducted in different settings such as community, hospital and clinics etc.
- The study can be replicated in large sample size.
- The study can be conducted on children of different age group.
- Effectiveness of this technique can be compared with other complementary therapies to find its effectiveness.
- The same study can be conducted in adults and old age people.
- The same study can be conducted with time series one group pre test – post test design.

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APPENDIX – A

Permission Letter From Hospital for Conducting the Study

**MASONIC MEDICAL CENTRE FOR CHILDREN**

**(A UNIT OF COIMBATORE MASONIC CHARITY TRUST)**

232, RACE COURSE ★ COIMBATORE - 641 018 ★ PHONE : 2220663 (6 Lines)

FAX : 0422-2221765 ★ E-mail : info@masonichospital.org

Date : .....

20th January, 2015

To

The Principal,
Annai Meenakshi College of Nursing,
Madukkarai Market Road,
P.B. No. 4431,
Industrial Estate (Post),
Coimbatore – 641 021.

Dear Sir / Madam,

Sub : Permission to conduct study - Reg

With reference to your letter No. Nil dated 05.01.2015, we wish to inform you that we will permit your student **Mrs. Lintu Eldo – II year M.Sc (N)** to conduct **"A STUDY TO EVALUATE THE EFFECTIVENESS OF WARM WATER FOOT BATH THERAPY ON REDUCING THE LEVEL OF TEMPERATURE AMONG CHILDREN WITH HYPERTHERMIA IN A SELECTED HOSPITAL AT COIMBATORE"** from 15.02.2015 to 15.03.2015 in our Masonic Hospital.

A copy of this study is to be submitted to the Hospital.

This is for your kind information.

Thanking you,

Yours faithfully,

Dr. R. KRISHNASWAMI, DCH
Reg. No. 38424
CHIEF MEDICAL OFFICER
Masonic Medical Centre for Children
COIMBATORE - 641 018

**(DR. R. KRISHNASWAMI)**
**CHIEF MEDICAL OFFICER.**

APPENDIX – B

Letter Requesting Experts Opinion for Content Validity of the Tools and Intervention.


# ANNAI MEENAKSHI COLLEGE OF NURSING

Affiliated with the Tamil Nadu Dr. M.G.R Medical University, Chennai.
Approved by the Indian Nursing Council, New Delhi &
Tamil Nadu Nurses and Midwives Council, Chennai.

Madukkarai Market Road,
P.B. No. 4431
Industrial Estate Post,
COIMBATORE - 641 021.

Phone : 0422 - 2675641, 2672705
Fax : 0422 - 2676016
Email : ceandct@dataone.in
ceandct@gmail.com
Website: www.annaimeenakshi.in


*Ref. No.*

*Date :* .....

**Requisition for Content Validity**

From

**Mrs. Lintu Eldo**
II - Year M.Sc(N)
Annai Meenakshi College of Nursing,
Coimbatore – 21.

Through
The Principal,
Annai Meenakshi College of Nursing,
Coimbatore – 21.

To

Respected Sir/Madam,

Sub: Requisition for expert opinion and suggestion for content validity of the tools – Reg.

---

I am a student of M.Sc., Nursing II year of Annai Meenakshi College of Nursing, Coimbatore, affiliated to The Tamil Nadu Dr. M.G.R. Medical University, Chennai. As a partial fulfillment of the M.Sc., Nursing programme. I am conducting a **"A Study to Evaluate The Effectiveness of warm water foot bath therapy on reducing the level of temperature among children with hyperthermia in selected hospital at Coimbatore".**

**I am hereby enclosing the following:**

1. Statement and objectives of the study
2. Hypothesis
3. Methodology
4. Tool
5. Intervention
6. Content Validity certificate.

Herewith I am submitting the developed tool for content validity and for expert opinion and possible suggestion. It will be grateful to you and request you to return the same to the undersigned at the earliest possible.

Thanking you,

Yours faithfully,

PRINCIPAL
Annai Meenakshi College of Nursing
COIMBATORE-641 021.

Place: Coimbatore
Date:

APPENDIX – C

Certificate of Validation


# ANNAI MEENAKSHI COLLEGE OF NURSING

Affiliated with the Tamil Nadu Dr. M.G.R Medical University, Chennai.
Approved by the Indian Nursing Council, New Delhi &
Tamil Nadu Nurses and Midwives Council, Chennai.

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94421 75641
98435 24219

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Fax : 0422 - 2676016
Email : ceandct@dataone.in
ceandct@gmail.com
Website: www.annaimeenakshi.in


*Ref. No.*

*Date :* .....

## Certificate of Validation

This is to certify that the tool submitted by **Mrs. Lintu Eldo.** M.Sc (N) II - Year student of Annai Meenakshi College of Nursing, Coimbatore, Tamil Nadu (Affiliated to The Tamil Nadu Dr. M.G.R. Medical University, Chennai) is validated by undersigned and can proceed with this tool and conduct the dissertation entitled conducting **"A Study to Evaluate The Effectiveness of warm water foot bath therapy on reducing the level of temperature among children with hyperthermia in selected hospital at Coimbatore".**

Place: Coimbatore

Signature

Date:

Name and Designation

# APPENDIX – D

## Name List of Experts who validated the Tool

Dr. KRISHNASWAMY, M.B.B.S., D.C.H.,

Chief Medical officer,

Masonic Hospital,

Coimbatore.

Dr. SENTHILKUMAR., M.B.B.S.

Consultant Paediatrician,

Masonic Hospital,

Coimbatore.

PROF. MARIYAMMAL PAPPU, M.Sc.(N).,

Professor,

K.M.C.H. College of Nursing,

Coimbatore.

Mrs.RAJESWARI, M.Sc.(N).,

Reader,

R.V.S. College of Nursing,

Sulur.

PROF.THENMOZHI, M.Sc.(N).,

Professor,

Texicity College of Nursing,

Coimbatore.

MRS KARTHIGASWARI, M.Sc.(N).,

Assisstant Professor,

R.V.S College of Nursing,

Sulur.

Mr.SELVAMUTHU, M.Sc.(N).,

Assisstant Professor,

Cheran's College of Nursing,

Coimbatore.

# APPENDIX - E

## CONSENT FORM

Respected Sir / Madam,

I am Mrs.Lintu Eldo, I am doing my second year M.Sc., (N) in Annai Meenakshi College of Nursing. I am conducting a Research on "A study to evaluate the effectiveness of warm water foot bath therapy on reducing the level of temperature among children with hyperthermia in a selected hospital at Coimbatore". I request your co-operation to complete my research. I assure you that you won't get any harm due to this intervention.

I Mr./Mrs. …… was explained about the effectiveness of Warm water foot bath therapy on reducing the level of temperature among children with the Hyperthermia by Mrs.Lintu Eldo. She explained me the benefits of this intervention. I agree with this intervention of Warm Water Foot Bath Therapy and this study project whole heartedly.

Yours faithfully,

Date :

Time :

# ஒப்புதல் படிவம்

மதிப்பிற்குரியோரே,

வணக்கம் லிண்டு எல்தோ என்ற நான் அன்னை மீனாட்சி செவிலியர் கல்லூரியில் செவிலியர் பட்ட மேற்படிப்பு படித்துகொண்டிருக்கிறேன். வெதுவெதுப்பான தண்ணீரில் பாதங்களை மூழ்க வைத்து காய்ச்சலை குறைக்கும் ஆராய்ச்சி செய்து வருகிறேன். இதற்காக நான் தங்களது முழு ஒத்துழைப்பை கேட்டுகொள்கிறேன். மேலும் இதனால் தங்களுக்கு எந்த ஒரு பாதிப்பும் ஏற்படாது என்பதை தெரிவித்துக் கொள்கிறேன்.

திரு./திருமதி …….. என்கிற நான் லிண்டு எல்தோ வழியாக வெதுவெதுப்பான தண்ணீரில் பாதங்களை மூழ்க வைப்பதன் மூலம் காய்ச்சலை குறைக்கலாம் என்பதை தெரிந்துகொண்டேன். இதனால் நான் இந்த சிகிச்சை முறைக்கு ஒப்புதல் அளிக்கிறேன்.

இடம்:

நாள்: கையொப்பம்

# APPENDIX - F

## SELF ADMINISTERED QUESTIONNAIRE

### DEMOGRAPHIC VARIABLES

Sample no:

Date:

1. Age in years

    a) 4-9 years

    b) 10-14 years

2. Gender

    a) Male

    b) Female

3. Duration of hospitalization

    a) One day

    b) Two days

    c) Three days

    d) More than three days

4. Type of ward

    a) General

    b) Private

5. BMI category

    a) <18.5 –under weight

    b) 18.5-25-normal weight

    c) >25 – over weight

6. Use of antipyretics

    a) Yes

    b) No

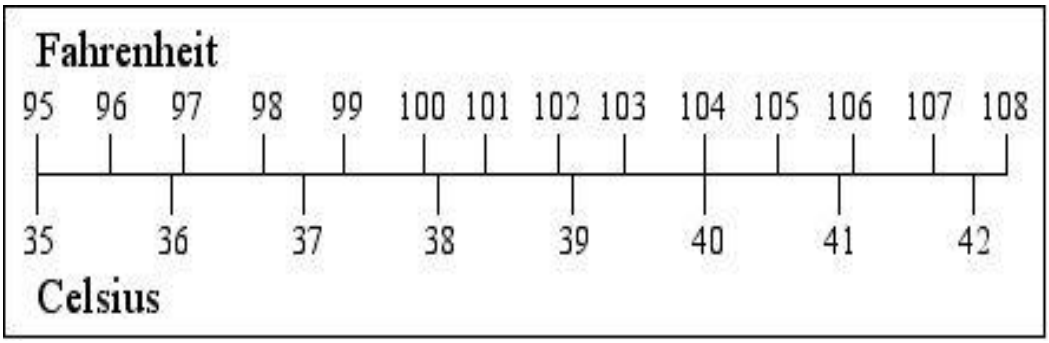
7. Use of antibiotics

    a) Yes

    b) No

# APPENDIX **G**

# SCORING KEY




Scoring procedure

Level of temperature is classified

94.5-99°F - Normal

99- 100°F - Low pyrexia

100.2-103° F - Moderate pyrexia

# APPENDIX -H

# PROCEDURE

## DEFINITION

A warm water foot bath therapy is a local immersion bath covering the feet and ankles at temperature ranging from 90°f to 110°F.

## INDICATION

Foot bath treatment can help with the following problems,

- Cold feet
- Chest congestion, colds, flu, cough, fever.
- Pelvic inflammatory disease.
- Headache and stopping nose bleeds.
- Relive fatigue and nervous tension.
- Body pain.

## CONTRAINDICATION

- Peripheral vascular disorder.
- Loss of sensation in the feet and leg.
- Buerger's diseases

## GENERAL INSTRUCTION

- Do not use warm water bath on patient with vascular diseases.
- Be careful to not burn the client when adding warm water.

## EQUIPMENT

- Foot tub-a large or deep dishpan.
- Lotion thermometer to test the water temperature.
- Kettle
- Wash cloths (large towel 1 or 2)

## PROCEDURE

### Preparation of procedure

- This treatment may be given with the patient sitting.
- Explain the procedure to the mothers of children and assist the client for the procedure.
- Prepare the foot bath with enough warm water to cover the ankles.

### Procedure

- Test the water temperature with the lotion thermometers to determine the comfort level and put your hands under the client feet carefully immersion them in the warm water bath for15 minutes.
- Completely wrap the patient and the foot tub with the sheet and blanket, leave head and neck exposed.
- Periodically add warm water to the foot bath to maintain heat, place your hand between the warm water being poured and the client feet (to avoid burning the feet).
- After procedure lift the client feet out of the warm water.
- Remove the tub and place the feet on the dry towel thoroughly dry the feet and toes.
- The client must rest after treatment.

# APPENDIX I

## PHOTOS